

Behavioral and Brain Sciences

From jamais to déjà vu: the respective roles of semantic and episodic memory in novelty monitoring and involuntary memory retrieval

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Corresponding Author:	Bruno Debrulle, MD, PhD McGill University Faculty of Medicine and Health Sciences CANADA
Corresponding Author Secondary Information:	
Corresponding Author's Institution:	McGill University Faculty of Medicine and Health Sciences
Corresponding Author's Secondary Institution:	
First Author:	Louis Renoult, PhD
First Author Secondary Information:	
Order of Authors:	Louis Renoult, PhD Bruno Debrulle, MD, PhD
Order of Authors Secondary Information:	
Abstract:	Barzykowski & Moulin model proposes that déjà-vu and involuntary autobiographical memories are the result of a continuously active memory system that tracks the novelty of situations. Déjà-vu would only have episodic content and concern interpretation of prior experiences. We argue that these aspects of the model would gain to be clarified and explored further and we suggest possible directions.

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Krystian Barzykowski & Christopher Moulin

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04. Full name(s): All authors, including any possible co-authors, listed at the top of your submission document.

Louis Renault¹

J. Bruno Debruille²

05. Institution

¹School of Psychology, University of East Anglia, UK

²J. Bruno Debruille, Department of Neuroscience, McGill University, Montreal, QC, Canada

06. Full institutional mailing address(es)

Louis Renault, Associate Professor, University of East Anglia, School of Psychology,

Lawrence Stenhouse Building (LSB), Norwich Research Park, Norwich, NR4 7TJ

United Kingdom

Dr. J. Bruno Debruille, Frank B. Common Pavilion, Douglas Hospital Research Center, 6875

Bldv Lasalle, Montréal (Qc) H4H 1R3, Canada

07. Institutional telephone number(s)

Louis Renoult: 01603591713

J. Bruno Debruille: 1 514 761 6131

08. Email addresses

L.Renoult@uea.ac.uk

bruno.debruille@mcgill.ca

09. home page url

Louis Renoult: <https://research-portal.uea.ac.uk/en/persons/louis-renoult>

J. Bruno Debruille: URL: <https://www.mcgill.ca/psychiatry/bruno-debruille>

10. Abstract (60 words max)

Barzykowski & Moulin model proposes that déjà-vu and involuntary autobiographical memories are the result of a continuously active memory system that tracks the novelty of situations. Déjà-vu would only have episodic content and concern interpretation of prior experiences. We argue that these aspects of the model would gain to be clarified and explored further and we suggest possible directions.

Commentary title: From jamais to déjà vu: the respective roles of semantic and episodic memory in novelty monitoring and involuntary memory retrieval

11. Main text of Commentary: (max 1000 words)

The model of Barzykowski & Moulin proposes an interesting comparison of involuntary autobiographical memories and déjà-vu experience, whereby déjà-vu would be the product of an underdeveloped form of involuntary memory retrieval. The model includes the attractive notion that familiarity / novelty detection mechanisms might need to be permanently active, sometimes leading to déjà vu experience and to false detections. Moreover, it is proposed that déjà-vu would only have episodic content and concern interpretation of prior experiences, rather than semantic knowledge. These interesting

aspects of their proposal are not elaborated upon, unfortunately. However, they are consistent with the finding that semantic and episodic memory appear to have different sensitivity to novelty processing. Repeated semantic processing has often been associated with the phenomenon of semantic satiation, a temporary loss of meaning attached to stimuli. Explicit attention to meaning is necessary to counteract these effects (Renoult, Wang, Mortimer, Debrulle, 2012). Once an object has been identified and categorized, the conceptual system may thus no longer be oriented to this particular object (Murphy, 2002). As shown in another work by the authors (Moulin et al., 2021), repeated semantic processing may actually lead to the opposite experience, the so-called, *jamais-vu* (never seen).

In contrast, episodic memory allows to encode unique events (even if it just a repetition of the same item, Tulving, 1972, 1983; or an event similar to a previous experience, Rubin & Umanath, 2015), while related neural processes may create distinct representations even for seemingly similar events (Nadel and Moscovitch, 1997; Norman, 2010; O'Reilly et al., 2014). Therefore, if *déjà vu* experiences depend on constantly active novelty detection mechanisms, episodic memory would thus be more likely to be associated with these experiences, consistent with Barzykowski & Moulin current proposal. Nonetheless, a better characterisation of these novelty detection mechanisms would help to better understand how the experiences of involuntary autobiographical memories and *déjà-vu* are generated.

As a matter of fact, the points made in the article that *déjà-vu* would “concern interpretation of prior experiences” and would typically happen for “familiar places and people” suggest a role for semantic knowledge. Consistent with the proposal that episodic memory operations typically require semantic memory (Tulving, 2002), one may ask, for example, whether *déjà vu* could be related to the retrieval of schema knowledge about a similar past experience, which would act as a cue for a (failed) episodic retrieval attempt. In other words, it could be that it is this activation of semantic knowledge about similar prior experiences that would trigger a retrieval mode: a “tonically maintained state” needed for episodic retrieval (Rugg & Wilding, 2000; Tulving, 1983). Accessing conceptual information can indeed prime the retrieval of specific memories (Reiser, 1985; Mace, McQueen, Hayslett, Staley, & Welch, 2019) and semantic processing of cues was proposed to be essential for episodic retrieval (Tulving, 1983). However, in the case of *déjà-vu*, this retrieval attempt may fail, or conflict with the awareness that the experience is novel. Presumably, the experience

of jamais vu (Moulin et al., 2021; O'Connor, Wells & Moulin, 2021) would similarly not be associated with the retrieval of specific memories. However, in that case, it would be due to disrupted semantic retrieval (semantic satiation), which may also deprive episodic memory from a relevant cue. Whether these proposals are valid or not, further exploration of the notion that déjà-vu would only have episodic content appears important, as well as clarifying the role of interpretative process (and of semantic knowledge) in generating these experiences.

Finally, as noted by Barzykowski & Moulin, the role of personal semantics (e.g., the type of personal semantics involved and the timing of its involvement) would be worth exploring further in the context of evaluating how it may influence or prime, as discussed in the article, the content of retrieval. For instance, activating context-dependent types of personal semantics (e.g., I visit this café every Monday) might more likely lead to the retrieval of involuntary autobiographical memories. More abstracted form of personal semantics (e.g., I take milk in my coffee) would more likely be restricted to feeling of familiarity or déjà-vu (Sheldon, Peters, & Renoult, 2020). This would be consistent with the findings of Berntsen, Staugaard, and Sørensen (2013) that involuntary episodic memories are retrieved more often in response to specific compared to more generic cues.

We thoroughly enjoyed the proposal of Barzykowski & Moulin and hope that further research, based on their model, will help clarify these issues.

12. Acknowledgements statement (optional): none

13. Competing Interest

L.R. and J.B.D have no competing interests to declare.

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